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18 June 1981

Japan Report

No. 128

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MILITARY

SELF-DEFENSE FORCE'S LIKELY AIRCRAFT PROCUREMENT REQUESTS IN FY '82

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 pp 6-7

[Text]

The three services of the Japanese Self-Defense Forces (SDF) are now proceeding with work on operations plans for FY 1982 prior to the FY 1982 budget request scheduled for late August. Their prospective requests for procurement of major aircraft in the next fiscal year are as follows:

Air Self-Defense Force (ASDF)

F-15J/DJ Fighter-Interceptor --- The ASDF has already ordered 57 aircraft out of 100 aircraft stipulated in the authorized F-15J procurement plan. Of the remaining 43 aircraft, its original schedule has envisaged 32 aircraft in FY 1982 and 11 in FY 1984. But the ASDF is expected to order all of the remaining 43 aircraft, including two F-15DJs, in FY 1982 in a bid to complete aquisition of the 100 aircraft in FY 1986 (or one year ahead of schedule.) There is also the possibility that part of the 11 aircraft would be added to the 32 aircraft to be ordered in FY 1982. While studying speeded-up F-15J procurement, the ASDF is also exploring the possibilities of additional procurement beyond the authorized 100 aircraft.

C-130H Transport --- The FY 1980-84 Medium-Term Defense Program (MTDP) has envisaged procurement of 12 new tactical transports, in addition to the 24-aircraft C-1 fleet, to complete its authorized 36-aircraft basic tactical transport fleet. The ASDF selected the Lockheed C-130H as its new tactical transport in FY 1980, and decided to order six aircraft each in FY 1981 and 1983. But only two of the six aircraft requested for FY 1981 have been funded. In FY 1982, the ASDF hopes to order the remaining four for acquisition in FY 1984. If the four are funded in the next fiscal year, the service would request the six planes in FY 1983. In case the government fails to approve the four in FY 1982, the ASDF would have to revise its C-130H procurement schedule.

Maritime Self-Defense Force (MSDF)

P-3C Antisubmarine Patrol Aircraft --- The MSDF hopes to complete aquisition of the authorized 45 P-3Cs in FY 1987 (or one year ahead of schedule.) Therefore, it is expected to add five P-3Cs (of the last 15 aircraft originally for ordering in FY 1984) to the 12 planes for FY 1982 procurement. Eighteen P-3Cs were funded in FY 1978 and 1980. If the 17 planes are funded in FY 1982 as expected, the MSDF might request the remaining 10 planes in FY 1983 instead of FY 1984. At the same time, it could consider additional procurement beyond the authorized 45 aircraft as is the case with the ASDF F-15J. This is an important matter in the FY 1983-87 MTDP being prepared in the current fiscal year.

HSS-2B Antisubmarine Helicopter --- The FY 1980-84 MTDP calls for ordering 46 HSS-2Bs, including 25 for shipborne missions. But the government has so far funded only eight aircraft -- two in FY 1980 and six in FY 1981. In order to accomplish the MTDP target, 12 to 13 aircraft will have to be funded each in FY 1982, 1983 and 1984. Besides the HSS-2B, the MSDF is to order seven S-61A helicopters by the end of the MTDP. The Japanese industry is capable of receiving orders for up to 15 antisubmarine helicopters per year. Although the MSDF is expected to request more than 10 HSS-2Bs in FY 1982, whether the government could approve them is uncertain due to fiscal constraints.

Ground Self-Defense Force (GSDF)

AH-1S Antitank Helicopter --- The GSDF intends to launch procurement of the AH-1S in FY 1982 because its evaluation of two AH-1S helicopters in FY 1979 and 1980 has produced favorable results. It expects to procure a total of 56 AH-1S helicopters for 3.5 squadrons with 22 helicopters planned for procurement by the end of the FY 1980-84 MTDP. Although a specific AH-1S procurement program is still under study, the GSDF apparently hopes to order six aircraft for its aviation school in FY 1982.

CSO: 4120/236

MILITARY

AIR SELF-DEFENSE FORCE MAY ORDER ADDITIONAL F-15J'S FROM FY '84

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 p 8

[Text]

The ASDF is expected to order additional 70 to 80 F-15J fighter-interceptors from FY 1984 under the FY 1983-87 MTDP after completing funding of the authorized 100 aircraft in FY 1982.

The authorized 100 F-15Js are designed to replace F-104Js (four squadrons) retiring between FY 1982 and 1985. The ASDF ordered 23 planes in FY 1978 and 34 planes in FY 1980. In FY 1982, it is expected to request 32 planes together with the last 11 planes which had been planned for FY 1984 procurement. This advanced procurement would enable the ASDF to finish aquisition of the planned 100 F-15Js in FY 1986 or one year ahead of schedule.

The additional F-15J procurement program will be necessary for justifying the advanced ordering of the authorized 100 planes. The 70 to 80 additional F-15Js will succeed part of F-4EJs (six squadrons), which will retire or be shifted to support-fighter squadrons in the future, in order to maintain the authorized 10 fighter-interceptor squadrons.

The additional F-15Js are also indispensable for accomplishing the National Defense Program Outline's target inventory of about 350 fighter-interceptors and support fighters. The outline calls on the ASDF to increase the number of fighters per squadron to 25 planes from the current 18. F-15Js will have to cover the increased number because no rise is planned in F-4EJs and F-1 support fighters. But even the additional 70 to 80 F-15s would be short of achieving the 350-aircraft target. To cope with the shortfall, the ASDF will have to consider countermeasures, including early development of an FS-X new support fighter.

The ASDF hopes to incorporate the additional F-15Js into the FY 1983-87 MTDP to be prepared in the current fiscal year. However, if financial constraints and other major defense equipment programs are taken into consideration, it would be difficult to include as many as 70 to 80 F-15Js in the new MTDP.

CSO: 4120/236

MILITARY

GROUND, AIR SELF-DEFENSE FORCE TO RECONSIDER 'PLAN' TO ADOPT PATRIOT AS SAM-X

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 pp 8-10

[Text]

The GSDF and ASDF may reconsider their tentative plans to select the U.S. Army/Raytheon Patriot (XMIM-104) as the SAM-X next-generation antiaircraft missile because the Patriot is now expected to be released for Japan's introduction far behind schedule.

The FY 1980-84 MTDP calls on the two services to determine and start procurement of the SAM-X to replace the ASDF Nike-J and GSDF basic Hawk. They have so far considered the Patriot as the most promising SAM-X candidate.

However, their joint survey mission sent to the United States in March 1981 found Japar will not be able to introduce the Patriot until FY 1984 or 1985 instead of FY 1982 as originally expected.

In view of the survey results, the GSDF has tentatively decided to request replacing one of the four basic Hawk units with an improved Hawk unit in FY 1982 and to study subsequent action while watching the United States' Patriot procurement moves. The ASDF intends to extend the service life of the existing Nike-J in the meantime.

But some quarters doubt the advisability of the two services' basic plan to adopt the Patriot. They point out that the Patriot could become outdated in the near future because 15 years have passed since Raytheon launched its development. Although the Patriot meets the present performance requirements. they say, its effective antiaircraft missions and value in the future are doubtful. Another problem rests with the Patriot's extremely high price, which has discouraged west European allies of the United States from introducing the missile. It may be difficult for Japan, now plagued by a large financial deficit, to purchase such a costly missile. Now that a substantial delay in introduction of the Patriot has become certain, the quarters recommend the Defense Agency to reconsider the tentative plan to favor the Patriot. Attention may be paid to whether the agency will continue to consider the Patriot as the SAM-X or to review its thoughts on the U.S. missile.

The GSDF began to replace basic Hawks with improved Hawks in FY 1977 after completing 8.5 basic Hawk units. Until FY 1981, the government has funded replacement of basic Hawks with improved models for 4.5 units. Although it had planned to replace basic Hawks for the four remaining units with Patriots from FY 1982, it has decided to use improved Hawks as the replacement for one of them in the face of the delay in Patriot introduction. It has yet to decide whether to give up Patriot introduction. But there is the possibility that all of the remaining basic Hawks would be replaced by improved Hawks instead of Patriots.

The ASDF will request funds in FY 1982 for domestic license production of Nike-J ground equipment (whose supply from the United States is to discontinue in FY 1985) in order to extend the present Nike-J's service life. Although it intends to continue to consider the Patriot as the Nike-J replacement, it is expected to promote research on the Nike-Phoenix, another SAM-X candidate. Therefore, the ASDF may seek funding of the research in FY 1982.

CSO: 4120/236

MILITARY

SH-X SURVEY TEAM LEAVES FOR U.S.

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 p 10

[Text]

A three-man MSDF mission, led by Cdr. Shiro Sukegawa of the Fleet Air Force Command, left Japan May 10 on a 15-day survey in the United States and Canada on the U.S. Navy/Sikorsky SH-60B (LAMPS/MK III) helicopter, a promising candidate for the MSDF's SH-X next-generation ship-borne antisubmarine helicopter to replace the HSS-2B in the 1990s.

The survey will serve as the basis for deciding whether to incorporate two green SH-60Bs for research into the FY 1982 budget request late in August as stipulated in the FY 1980-84 Medium-Term Defense Program.

The green aircraft will be equipped with HSS-2B components to determine the MSDF's unique SH-X configuration through various tests.

The ongoing survey will center on SH-60B purchase costs and SH-X development costs. If the price of the two green SH-60B aircraft is proven acceptable, they would be included in the budget request.

CSO: 4120/236

AIR SELF-DEFENSE FORCE TO DRAFT NEW H-X PROCUREMENT PLAN

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 p 4

[Text]

The ASDF is expected to draft a new program for procurement of H-X new rescue helicopters as part of the FY 1983-87 Medium-Term Defense Program (MTDP) which will be prepared by the end of the current fiscal year (March 1982).

The current MTDP covering five years from FY 1980 includes a plan to procure seven rescue helicopters of the new H-X type to replace older KHI KV-107s. If the new H-X type is selected from existing models, this plan could be implemented. But an ongoing inspection for the KV-107A is expected to prove its service life can be extended, making it unnecessary to procure the replacements by the end of the current MTDP. Therefore, the ASDF is expected to develop a new type of helicopter or an improved version of the KV-107 as the H-X.

In that case, the ASDF may increase the H-X procurement number from the original seven aircraft under the FY 1983-87 MTDP in order to boost the benefit of the development taking two to three years. It is considering replacing serviceable KV-107s as well as outmoded ones with the H-X helicopters. The serviceable KV-107s could be used for missions other than rescue.

CSO: 4120/237

MILITARY

AIR SELF-DEFENSE FORCE SENDS C-130H SURVEY TEAM TO U.S.

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 4-5

[Text]

The ASDF sent a four-man team to the United States in mid-May for a 21-day survey on Japan's introduction of the Lockheed C-130H transport starting in the current fiscal year.

The team, led by Col. Hisao Kono of the Logistics Department, Air Staff Office, will visit the U.S. Defense Department, the Air Force Logistics Command, Lockheed-Georgia, Aviation Power Supply and others concerned to study details of the two C-130Hs for ordering in FY 1981.

Although the ASDF had requested six C-130Hs for FY 1981, only two have been approved. It intends to request funding of the remaining four in FY 1982. The survey will also cover the price of the four aircraft prior to the FY 1982 budget request in late August.

CSO: 4120/237

MILITARY

GROUND SELF-DEFENSE FORCE EXPECTS TO ORDER 22 AH-1S HELICOPTERS IN FY '82

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 5-6

[Text]

The GSDF expects to order 22 Bell AH-1S antitank helicopters in FY 1982 with fiscal disbursement over a five-year period. But it may be difficult for the government to fund all of the 22 helicopters, which would cost more than ¥30,000 million if produced in Japan under license.

The FY 1980-84 MTDP calls for the ordering of 24 new antitank helicopters for 1.5 squadrons. Two have already been purchased for operational evaluation. Of the remaining 22, the GSDF hopes to acquire six in FY 1984 and eight each in FY 1985 and 1986. This schedule is seen as indispensable to domestic license production

Attention is now being paid to how many AH-1S helicopters the JDA would request in FY 1982. The GSDF plans to procure a total of 56 AH-1S helicopters for 3.5 squadrons eventually.

CSO: 4120/237

MILITARY

MARITIME SELF-DEFENSE FORCE TO REQUEST SH-X OR NEW SUPPORT PLANES IN FY '82

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 6-7

[Text]

The MSDF is expected to request either two SH-X new ship-borne antisubmarine helicopters or three high-speed training support aircraft in FY 1982, although it originally intended to order all of them simultaneously in the next fiscal year.

This change is because priority will be given to an advanced funding request for P-3C antisubmarine patrol aircraft which will enable the MSDF to complete acquisition of the 45 authorized P-3Cs in FY 1987, or one year ahead of schedule.

Whether to request both of the SH-X's and the training support aircraft simultaneously may be decided in June after the MSDF's SH-X survey team returns home late in May from a tour of the United States and Canada. These aircraft's procurement is stipulated in the FY 1980-84 MTDP.

The two SH-X's are green aircraft of the U.S. Navy/Sikorsky LAMPS/MK-III SH-60B, which will be equipped experimentally with antisubmarine components of the HSS-2B to develop a unique new ship-borne antisubmarine helicopter to replace the HSS-2B in the 1990s. The survey team will specify costs and other problems for SH-60B procurement.

The new training support aircraft are designed to improve MSDF ships' antimissile defense and electronic warfare training. Promising candidates for the new support plane include the MHI MU-300, the Gates Learjet 35 and the Dassault-Breguet Falcon 20, all business jets. Whichever is selected, it will be modified for the MSDF's specialized missions.

Procurement is expected to total only nine aircraft. In consideration of long-term costs and maintenance, some quarters favor the domestically-produced MU-300. But others say the cheapest candidate should be adopted due to current financial restraints. There may be still a long time before final selection.

CSO: 4120/237

MILITARY

DELIVERY OF FIRST AIS FOR F-15 TO BE COMPLETED

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 pp 6, 7

[Text]

C. Itoh Aviation, an importer of the avionics intermediate shop (AIS) for testing electronic systems of the McDonnell Douglas F-15 fighter from Bendix, was to complete delivery of the first AIS to the Air Self-Defense (ASDF) on June 1.

The first AIS, comprising six stations, was ordered from Bendix through C. Itoh Aviation in FY 1979. About 90 percent of the AIS has already been delivered. Three stations of the first AIS have been installed at Komaki Minami Works of Mitsubishi Heavy Industries Ltd. (MHI), the prime contractor for license production of the ASDF F-15Js, for tests lasting until September.

After the tests, the first AIS will be assembled at the ASDF's Nyutabaru Air Base to undertake operational tests of its first F-15J starting in December or after.

The second AIS for Chitose Air Base was ordered in FY 1980 with delivery scheduled for FY 1982. The third one for Hyakuri Air Base has been funded under the FY 1981 budget. It will be delivered in FY 1983. The ASDF is considering purchasing more AIS systems in the future.

CSO: 4105/242

MILITARY

GSDF TO REQUEST THREE AA SIMULATORS IN FY 1982

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 pp 7, 8

[Text]

The Ground Self-Defense Force (GSDF) plans to order three aitiaircraft firing simulators in FY 1982 after as many in FY 1981 to complete its AA simulator procurement program.

The GSDF already has firing-drill simulators for Hawk surface-to-air missile systems and L-90 35mm AA machine gun systems linked with fire-control systems (FCS). But there are no such simulators for the Caliber 50 12.7mm heavy machine guns and L-90s not linked with FCS's. These weapons systems would have to be manually fired when enemy aircraft suddenly intrude at low levels. Simulators are necessary for simulated manual firing training for these gun systems because firing training is rarely carried out. New simulators will also be used for the Tan-SAM and portable surface-to-air missiles to be procured from the current fiscal year.

The GSDF ordered one such simulator worth ¥130 million for its Antiaircraft Artillery School. The three for ordering in FY 1981 will be installed one each at the Fuji School, the AA Training Group and one of the district armies. Funds totaling ¥480 million are earmarked for them in the FY 1981 budget.

All of the three simulators planned for ordering in FY 1982 will be used for district armies. If they are funded, the GSDF could complete a procurement program for seven new firing training simulators.

CSO: 4105/242

SCIENCE AND TECHNOLOGY

NEW EXPERIMENTAL RAIL AND FLOAT CAR MLU-001 DESCRIBED

Tokyo KOTSU GIJUTSU in Japanese Mar 81 pp 74-77

[Article by Takuji Sasaki, National Railway Vehicle Design Office: "Japan's New Experimental Car MLU-001"]

[Text] 1. Introduction

The basic testing phase of the flotation format railway development has been concluded with the attainment of a new high speed record of 517 kilometers with the ML-500; and now a new utilization oriented phase is about to be launched.

The agenda for the next phase included: conversion of the Miyazaki experimental line's rail structure from inverted T to U-shape and construction of an experimental float (surface gliding) car that approximates the actual vehicle--that is, one in which the chassis is separate from the platform car.

The details of this conversion from inverted T to U-shape and the particulars of this new experimental car MLU-001-1 are given below.

2. Guideway

With regard to the guideway, the traditional inverted T structure, with a protrusion in the middle, was converted to U-shape with side walls on both sides. Figure 1 shows a cross-section of the U-shaped track and the experimental car. The inverted T rail's flotation ground surface coil and propulsion guidance ground surface coil were diverted for the U-shaped model. Although there is a place finder shutter board in the middle of the track, the track is streamlined and grooved.

Until now, the electric power supply section attached to the propulsion guidance coil was only 29.4 meters long because it previously supplied only one running vehicle, but this time it has been changed to 43 meters in length because three vehicles will run together.

3. Coil Placement

In the case of the ML-500, the car had an L-shaped superconduction electromagnet and was equipped with a separate propulsion guidance coil and a flotation coil (see Figure 2).

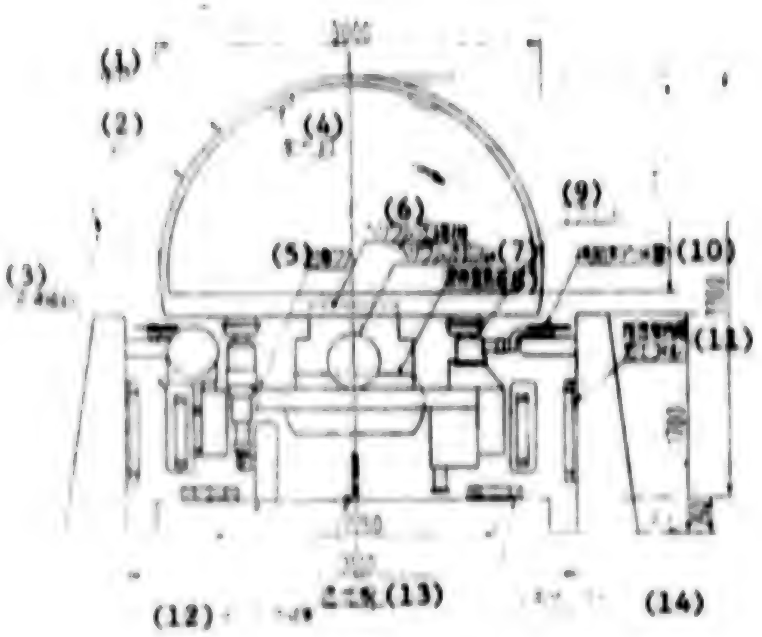


Figure 1. Sectional View of U-Shaped Rail and Float Car

Key:

1. Chassis
2. Window
3. Superconduction electromagnet
4. Fluorescent light
5. Platform car frame
6. Helium compressor
7. Helium cooling unit
8. Liquid nitrogen reserve
9. Air spring
10. Supplementary guidance unit
11. Ground surface coil for propulsion guidance
12. Auxiliary support unit
13. Shutter board
14. Ground surface coil for flotation

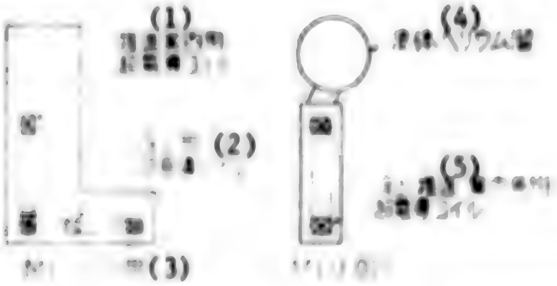


Figure 2. Superconduction Electromagnet Cross-Section

Key:

1. Superconduction coil for propulsion guidance
2. Superinduction coil for flotation
3. For the ML-500
4. Liquid helium storage
5. Superconduction coil for flotation, propulsion and guidance

This time, as a result of technological advancement which enabled the creation of a superconduction coil with a high initial magnetic force of 700 kAT, a dual-purpose (propulsion and flotation) single coil I-shaped magnet was used.

Figure 1 shows the placement of each coil. Ground surface propulsion guidance coils are placed facing each other and at right angles to the ground surface flotation coil.

4. Superconduction Electromagnet

As a result of converting the superconduction electromagnet to an I shape, the structure was simplified and a significant improvement in performance with respect to weight and heat intrusion volume became possible. Figure 3 presents a comparison of the new and the traditional models of superconduction electromagnets with regard to weight and heat intrusion volume, using unit coil length and kAT.

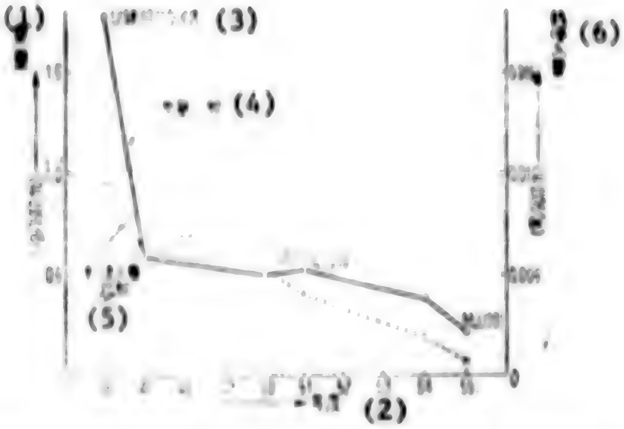


Figure 3. Performance Comparison of Different Superconduction Electromagnets

Key:

1. Weight	4. Weight comparison
2. Year (beginning with 1971)	5. Heat intrusion comparison
3. Test cryotron	6. Heat intrusion

The particulars of the new superconduction electromagnet are as indicated in Table 1. A single magnet has two coils, and contains a liquid helium storage area in the upper portion and a condensation heat converter that corresponds to the car's cooling system within it.

5. Vehicle Cooling System

The ML-500 used an open drive which expelled helium, which evaporated due to heat intrusion, or a shutoff drive which shut off the superconduction electromagnet and maintained balance by raising the internal pressure. In the former case, there was loss of valuable helium and in the latter instance, there was the problem of greatly restricting the experiment running time.

Table 1. Principal Elements of Superconduction Electromagnet

	Features
Coil configuration, size (width X length in mm)	Race track shape (500 X 1700)
Coil's starting magnetic force (k Ampere-turn, kAT)	700
Number of coils (per 1 cryotron)	2
Coil pole pitch (mm)	2100
SCM form, size (width X length X height in mm)	I configuration (410 X 4000 X 1150)

For the current experimental car, a vehicle cooling system whereby the evaporated helium is cooled by the cooling system mounted on the car, then liquefied and restored to the superconduction electromagnet, was adopted. Figure 4 shows details of the principles of the vehicle cooling system.

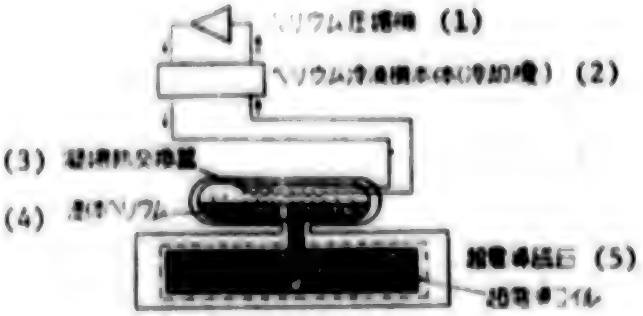


Figure 4. Diagram of a Cooling System Mounted on the Car

Key:

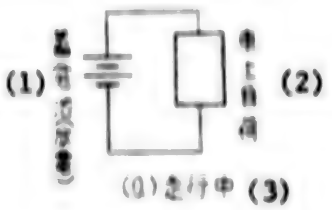
1. Helium compressor
2. Helium cooling unit, main body (cooler)
3. Condensation heat converter
4. Liquid helium
5. Superconduction electromagnet
   Superconduction coil

With regard to the basis of the cooling system--the running mode of the helium compressor--several alternatives such as an engine or motor are possible. In the vehicle cooling system for the ML-500 (ML-500R), an engine was used to run it. However, in terms of utilization in the future, the electromotor format is preferable after all. Thus although there are many development requisites, induced electromotor generation was adopted for the current model.

There is one helium compressor and one helium cooling unit and these cool four superconduction electromagnets.

6. Supplementary Source of Electricity

An electric battery mounted on the vehicle is the source of electricity for the helium compressor's induction electromotor and control/measurement equipment aboard the car. A nickel/cadmium electric battery which is especially noted for short charge/discharge time is used. Two charging rails are set up at the start of the test line, and the experimental car is charged from the ground surface through a current collector (see Figure 5).



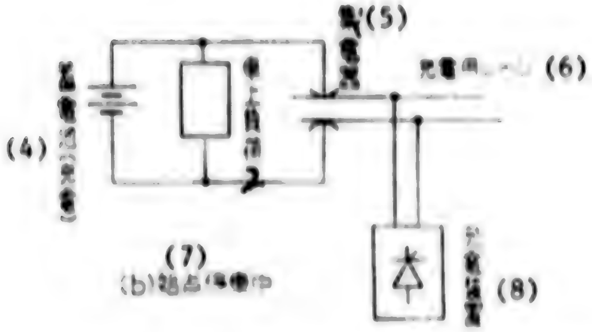


Figure 5. Source of Electricity Aboard the Car

Key:

1. Battery (discharge)
2. Electric load aboard the car
3. While the vehicle is running
4. Battery (charge)
5. Current collector
6. Charging rail
7. Starting point--while the vehicle is stationary
8. Charging equipment

The source of electricity for the helium compressor and so forth depends on conversion of the electric battery's direct current output into three-phase alternating current by an inverter. The electric source for control and measurement is supplied through conversion of the battery's direct current output to a stable ± 24 V electric source by means of a DC-to-DC converter.

With future utilization in mind, tests on noncontact current collection is being considered. This will be done by mounting an induction coil for current collection on the car whereby the ground surface flotation coil's electric current induced by the superconduction electromagnet is further induced onto the abovementioned coil on the car and electricity is thus obtained.

7. Control Equipment

Propulsion of the test car is dependent on the linear synchronous motor (LSM). Basic to this control method is the need for a dual place finder signal between the superconduction electromagnet and the ground surface propulsion guidance coil.

For this reason, a place finder shutter board is affixed at the center of the guideway corresponding to the propulsion guidance coil. An optic place finder facility on board the car seeks it out and transmits the place finder signal to the ground side. The same unit is used for calculation of basic data such as distance and speed.

The control equipment aboard the vehicle gathers various types of data regarding the test car and it also controls oil pressure equipment and so forth as well as receiving and sending data via a wireless transmitter. It calculates speed and distance from the place finder signals. It also collates the car's performance with the preestablished brake pattern and forms the backup to the ground surface brake pattern.

The central control equipment on the ground side is a converted unit taken from the ML-500. The reconstruction involved additions to the cooling system on board the car, the auxiliary source of electricity and the three-vehicle unit structure; a change in the distance count method due to the change in section length; the addition of automatic reverse drive capability and so forth.

8. Chassis and Platform Car

The floating car is being considered in terms of three vehicles. The length--with three vehicles--becomes 28.8 meters. The car under examination is the lead car. For the time being, it will run as a single vehicle; therefore, it has a dummy unit attached to it toward the rear. It is 12.2 meters long, 3 meters wide and and 3.3 meters high, and weighs approximately 10 tons. Figure 6 shows a side view of the float car.

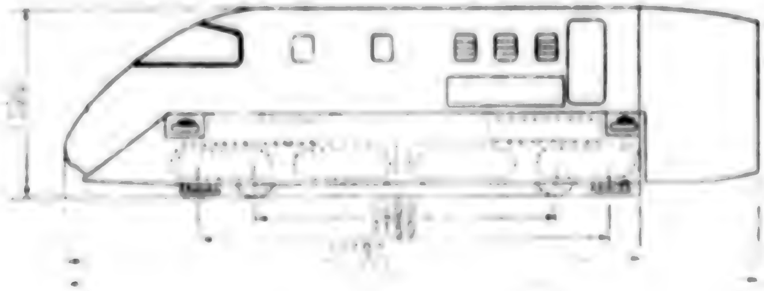


Figure 6. Side View of the Float Car

The chassis is fishcake shaped (semicircular). Aluminum, heat-treated alloy boards are attached to the frame--inside and out--by rivets; and it uses sandwich panel construction in which the space in between is filled with hard polyurethane. The flooring is aluminum honeycomb.

Since this is a test car, the height of the vehicle is as low as possible in order to minimize air resistance. The interior of the car is separated into two rooms (front and rear) by a divider. The front room is the measurement equipment room and the rear compartment is the auxiliary electric source equipment room. Each has its own openings. They are the right front entry-exit of the forward compartment, and the left rear entry-exit of the rear compartment. In addition, a portion of the floor is an inspection lid, and operation and inspection of the equipment beneath the flooring is possible from inside the compartment.

The platform car is a box-shaped construction with a side beam, a corner beam and a horizontal beam. Aluminum ternary alloy (aluminum, zinc and magnesium) is used.

The superconduction electromagnet is attached to the side beam; and the helium compressor, helium cooling unit and oil pressure equipment--comprising the cooling system on the car--are affixed to the upper part of the horizontal beam.

The chassis and platform car are connected by right and left anchors, and an air spring is used for the car's vertical support.

Progress of Super-High Speed Railway

1962	Survey on super-high-speed railway begins.
1969	Linear motor high-speed characteristic testing facility is test produced and various features are researched.
1970	Super-high-speed railway survey group is organized, our agency serving as the pivotal force.
	Basic testing facility for superconduction electromagnetic flotation is test produced and the basis for induction repulsion model superconduction electromagnetic flotation becomes firm.
1971	Successful magnetic flotation run of approximately 50 km/h at the Railway Technology Research Institute, using the superconduction electromagnet on board the car and LSM propulsion.
1972 October	Successful 60 km/h magnetic flotation run with LIM propulsion format ML-100.
1974	Test production of super-high-speed railway, electric power circuit model unit.
	Successful flotation run of LSM propelled ML-100A at 60 km/h.
1977 July	Test run on Miyazaki experimental line commences.
1978 June	High-speed run (300-350 km/h) tests.
1979 May	Helium cooling unit mounted car (ML-500R) makes test run.
August	Curb clearance and high-speed run tests.

December	Development goal of 500 km/h maximum speed attained and surpassed; 517 km/h recorded.
1980	Conversion of guideway's traditionally inverted T formation to U-shaped configuration (sectional view). Manned test car MLU-001-1 makes test run.

9. Auxiliary Support Guidance System

As with the ML-500 low speed run where electromagnetic power is lacking, the car is maintained and guided by rubber tires. Support wheels run inside of the flotation ground surface coil and the guide wheels go above the propulsion guidance ground surface coil.

These wheels are lifted and set in place by means of an oil pressure piston. In order to neutralize the shock and vibration when stopping the train, it contains a shock absorber which operates on the principle of nitrogen gas/oil pressure.

The rubber tires are high pressure pneumatic tires such as those used on airplanes, and the support wheels are equipped with disk brakes which are operated by oil pressure.

10. Schedule for Future Experiments

The new experimental car was introduced on the Miyazaki experimental line in October 1980. After assemblage and adjustment at the site, it went on to stationary and operational tests.

A successful self-propulsion run test was conducted in November and a successful flotation run test was carried out in December. Thereafter, various types of tests have been conducted. During February and March 1981, it is planned to conduct a basic test for noncontact collection of electricity. The basic capabilities of the car and their characteristics are shown in Table 2. Due to the enlargement of the vertical mass of the float car and the consequent increase in air resistance and the restrictions imposed on the length of the experimental line, the maximum speed will be about 400 km/h.

11. Conclusion

The Flotation Railway Project, which has achieved a high speed record of 517 km/h with the ML-500, has moved from the high-speed experiment phase to the safe-run testing phase. The vehicle's utilization is one step closer to reality. Hereafter, not only tests involving runs with a single vehicle but also tests on organizational runs, which is the basis of utilization prerequisites, and various other tests are planned.

The "Dream Railway" is fast becoming the "Railway of Tomorrow." We ask for the continued support and cooperation of the people in the future.

Table 2. Basic Capabilities and Characteristics

Standard weight		10 t/car
Maximum speed sought		400 km/h
Flotation	Method	Superconduction induction/repulsion magnet flotation
	Float strength	10 t
	Float height	100 mm
Guidance	Method	Null-flux magnetic guidance
	Guidance strength	5 t (50 mm displacement)
Propulsion	Method	Linear synchronous motor at ground surface on the side of the primary car
	Number of phases	3 phases
	Frequency	0-27 Hz
	Electric pressure	3000 V
	Electric current	1100 A
Braking method		Regeneration and power generating brakes
Control method		Automatic, patterned control run

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CSO: 8129/0978

SCIENCE AND TECHNOLOGY

MDC-FOKKER JOINT VENTURE SHOCKS JAPAN'S INDUSTRY

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 pp 3-4

[Text]

McDonnell Douglas Corp.'s (MDC) agreement with Fokker Aircraft Co. on joint development of the 150-seat MDF-100 commercial transport has shocked the Japanese aircraft industry and the Ministry of International Trade and Industry (MITI) which have been considering development of a similar transport called the Y-XX.

Outwardly, MITI and industry showed a cool reaction to the MDC-Fokker accord. They said the MDC-Fokker venture will serve as a new factor for shaping the Y-XX program.

But the MDC-Fokker accord certainly affected their possible selection of Fokker and Boeing Co. as partners for the Y-XX program. In fact, they are shocked at Fokker's sudden changeover. So far, Fokker Chairman F. Swarttouw has frequently visited three Japanese aircraft manufacturers and Boeing, and put forward a plan to develop the Y-XX by Fokker, Boeing and Japan all on an equal footing. Fokker's transformation means the Dutch manufacturer has failed to reach a compromise with Boeing which has sticked to its dominant leadership in the program. Apparent factors attracting Fokker's shift to MDC include world airlines' tendency toward avoidance of Boeing's monopoly and MDC's flexible attitude toward the Fokker-favored equal shares in the aircraft's development.

Beside Fokker and Boeing, MDC and Airbus Industrie have approached the Japanese on the Y-XX program. But the Japanese have responded cooly to them in view of Boeing's strength and relations with Japan regarding the B-767 program. Therefore, the Japanese are now in a difficult position. In case the Japanese select only Boeing as a partner for the Y-XX program, they would have to raise massive development funds or become only a subcontractor to Boeing. Deploring Japan's small share in the 767 program, however, the Japanese industry is eager to take the initiative in the Y-XX program. Thus, the Japanese are now at crossroads.

Meanwhile, MDC and Fokker leaders are scheduled to visit Japan again late in May in a bid to invite the Japanese industry to take part in their MDF-100 program. MITI is taking a positive attitude toward their fresh approach because they attach weight to equality in the joint program. The ministry thinks that the Japanese could take a large share or even leadership in the program. But uncertainties about the powerplant of the MDF-100 are a problem for MITI which wants to use the Rolls-Royce/Japanese RJ500 for the Y-XX in order to promote Japan's aeroengine sector as well as the airframe manufactures. The RJ500 now under development is designed to have a thrust of nine tons for a 120-seat aircraft. Although Boeing has expressed strong interests in an improved RJ500 version with a 12-ton thrust for a 150-seat aircraft, MDC and Fokker have mentioned no specific engine for the MDF-100. Thus, MITI would not be able to make any easy response to the MDC-Fokker approach.

On the other hand, there is the possibility of Boeing proposing to the Japanese a more attractive program for development of a 150-seat aircraft in reaction to the MDC-Fokker accord.

CSO: 4120/236

SCIENCE AND TECHNOLOGY

FOKKER CHAIRMAN IN TOKYO ON MDF-100

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 pp 4-5

[Text]

F. Swarttouw, Chairman of Fokker Aircraft Co., was in Japan early this month for talks with top executives of the three Japanese major aircraft manufacturers (i.e., MHI, KHI and FHI) as well as officials of MITI's Aircraft and Ordnance Section.

Swarttouw reportedly told the Japanese industry and government leaders that the McDonnell Douglas - Fokker group plans to begin development of the MDF-100 150-seater aircraft at the end of this year or early 1982 so that it may enter commercial service around 1986. He also told the Japanese that the group welcomes Japan's participation in the MDF-100 program as a risk-sharing partner, it was reported.

The Fokker Chairman added that the two companies will make an official proposal to the Japanese aircraft industry in a few weeks.

Swarttouw was reportedly informed that the Japanese would be prepared to make substantial studies on the MDF-100 program after receiving the official proposal from the McDonnell Douglas - Fokker group.

CSO: 4120/236

SCIENCE AND TECHNOLOGY

RRJAEL TO CONTINUE RJ500 DESIGN WORK

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 p 5

[Text]

The Board of Directors of Rolls-Royce and Japanese Aero Engines Limited (RRJAEL) has decided to continue with the design of the RJ500 engine to meet the requirements of aircraft currently being planned by Boeing, McDonnell Douglas/Fokker, Airbus Industrie and the Japanese aircraft industry. The fifth board meeting of RRJAEL was held in Tokyo on May 7.

Dr. Osamu Nagano (Advisor of IHI and President of the Engineering Research Association for Aero-jet Engines) was appointed Chairman of the joint venture to hold office from the date of the fifth board meeting to the date of the board meeting to be held after April 21, 1982. The first Chairman was A. R. G. Raeburn (Managing Director of Rolls-Royce Limited). The position of Chairman rotates every year, according the Articles of Association of the Company.

Hiroharu Tsukamoto (Executive Director of KHI) retired as a Director of RRJAEL. He was succeeded by Teruaki Yamada (Executive Director of KHI).

CSO: 4120/236

SCIENCE AND TECHNOLOGY

SONY VIDEO SYSTEMS SELECTED FOR 767

Tokyo JPE AVIATION REPORT-WEEKLY in English No 522, 20 May 81 pp 5-6

[Text]

Sony Corp.'s VPH-470 color video projection system and SL-2700PS Beta Max video player have been designated by the Boeing Co. as standard entertainment options for the Boeing 767, a medium- and short-haul transport under development by Boeing, Italy and Japan. Boeing is the first aircraft manufacturer to select Sony systems as standard options.

Sony expects sales of these video systems will increase sharply thanks to the designation by the aerospace giant.

The Japanese video and audio system manufacturer has so far approached airlines around the world on sales of such aircraft entertainment systems. It has already received orders for 133 sets of such systems for 35 aircraft from JAL, 90 sets for 30 767s from United Air Lines, 30 sets for six 747s from Saudi Arabian Airlines, 15 sets for three 747s from China Airlines, 10 sets for two 747s from Thai Airways International and others. Recently, Sony landed orders for 200 sets for 40 L-1011s from Delta Airlines with delivery scheduled to begin in April 1982.

Boeing has adopted the Sony systems because they have been popularly used by many carriers and meet the aircraft manufacturer's strict requirements.

The world's 767 orders have already reached about 300 aircraft. Sony is hopeful that its systems will be used for the majority of 767s.

CSO: 4120/236

SCIENCE AND TECHNOLOGY

NEW FIRM PLANNED FOR JAPAN'S 767 PRODUCTION, SALES

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 1-3

[Text]

The Ministry of International Trade and Industry (MITI) plans to have airframe manufacturers start a new firm in the autumn of 1982 for production and sales of the Boeing 767 now under development jointly by Japan, Italy and the Boeing Co.

At the same time, Civil Transport Development Corp. (CTDC), which undertakes the 767 development program, will take charge of developing a new 150-seat medium-size transport called the Y-XX. Nihon Aeroplane Manufacturing Co. (NAMCO), which was originally established for production and sale of YS-11 turboprop transports, will be disbanded in FY 1982 with production of YS-11 spare parts undertaken by individual makers.

Thus, MITI intends to establish a new Japanese aircraft industry structure under which (1) aircraft development will be undertaken jointly by the government and private sectors and (2) production and sales by the private sector alone. The ministry asked the aircraft industry subcommittee of the Aircraft Machinery Industry Council to prepare recommendations on details of such a new aircraft industry organization.

One reason for the MITI plan to transform the aircraft industry structure is that the year 1982 is seen as a turning point for the industry. The 767 program will shift to the mass-production stage in the autumn of 1982, while the Y-XX program's full-scale development stage will start in FY 1982. The major work of NAMCO, meanwhile, has been finished. Thus Japan's aircraft industry will be at a major turning-point in 1982. MITI wants to develop the aircraft industry into one of Japan's main industries because the industry can contribute much to advancement of other industries and has high added value.

The MITI plan conforms to recommendations made by its advisory council in August 1980, which called for establishment of a central organization for aircraft development and a separate one for production and sales in order to coordinate activities of the participating manufacturers. The recommendations also urged that the private sector should be responsible for aircraft production and sales and that the government should take part in development by appropriating loans.

CTDC, established by Mitsubishi Heavy Industries Ltd. (MHI), Kawasaki Heavy Industries Ltd. (KHI) and Fuji Heavy Industries Ltd. (FHI), has served as the coordinator for the 767 program since 1978. The government has given it loans totaling ¥14,280 million through FY 1980. The amount accounts for a half of Japan's 767 program funds.

The new firm will also be organized mainly by the three airframe manufacturers, although component makers and trading houses may also take part in it. Its establishment will follow preparation of the advisory council's new recommendations expected this autumn. The new firm could possibly undertake production and sales of the Y-XX as well as the Boeing 767 in the future.

The Y-XX program will enter the full-scale development stage in FY 1982 with foreign partners selected. In the current fiscal year, participating Japanese manufacturers are to draft a preliminary design. Although CTDC has close links with Boeing because of the 767 program, MITI intends to have it undertake the Y-XX program even if foreign manufacturers other than Boeing are selected as partners.

The semi-governmental NAMCO's disbandment will form part of the government's administrative reform of the industry. NAMCO has already ceased production of YS-11s. After its disbandment, individual private companies concerned will take charge of producing spare parts for the currently-operated YS-11s.

CSO: 4120/237

SCIENCE AND TECHNOLOGY

JAPANESE DEFENSE AGENCY TO NAME MT-X PRIME CONTRACTOR BY LATE 1981

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 3-4

[Text]

The Japanese Defense Agency (JDA) is expected to name a prime contractor for development of the MT-X next-generation intermediate trainer during the second half of the year.

It has already requested MHI, KHI and FHI to submit their proposals on the MT-X program by mid-June. After receiving the proposals, the JDA may take one to two months to complete all necessary in-house coordination involving the Technical R&D Institute (TR&DI), the Air Self-Defense Force (ASDF) and internal bureaus and consultation with MITI. Thus it would be difficult to select a prime contractor from the three firms before the FY 1982 budget request in late August. Therefore, the JDA may prepare a funding request for detailed design of the MT-X in FY 1982 on the basis of the average of the three firms' estimates, putting off selection of the prime contractor until this autumn.

But such an indefinite funding request based on such an average estimate may not serve to secure necessary funds for the detailed design as the Finance Ministry is expected to scrutinize the budget request strictly to save as much appropriations as possible as part of its fiscal policy. In order to prepare a definite funding request on the basis of a specific proposal, the JDA would have to select the prime contractor in late June before starting work on the FY 1982 budget request.

Whenever the selection is made, the JDA may have to consult fully with MITI as the industry administrator on how best to coordinate the MT-X program and other aircraft projects with a view to improving the aircraft industry as an important part of Japan's defense setup.

CSO: 4120/237

AIR SELF-DEFENSE FORCE WORKING ON VULCAN MODIFICATION PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 p 5

[Text]

The ASDF is facilitating preparation of final performance requirements for a modified Vulcan 20mm machine gun system for air base defense as funds totaling ¥100 million have been earmarked in the FY 1981 budget for experimental modification of two Vulcan systems aboard the F-104J fighter.

The new system is planned to engage in antiaircraft missions at air bases together with the separate 20mm Vulcan Air Defense System (VADS), the Tan-SAM short-range surface-to-air missile and the Portable SAM. As to the VADS, three systems were purchased in FY 1979 for evaluation.

The modification program has been devised for efficient use of Vulcan systems aboard retiring F-104Js.

Upon preparation of the final performance requirements, the ASDF will select a prime contractor for the modification program from two contenders -- Japan Steel Works and Nittoku Kinzoku Kogyo. The former has manufactured antiaircraft machine guns for the GSDF, while the latter has produced 20mm guns for the ASDF and MSDF.

CSO: 4120/237

AW-X GUN PRODUCTION EXPECTED TO START IN FY '88

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 p 6

[Text]

Mass production of the GSDF AW-X self-propelled anti-aircraft gun using the chassis of the Model 74 tank is expected to start in FY 1988 to maintain Model 74 tank production lines after procurement of the tanks ends in FY 1987.

Although the AW-X is designed to have a modified version of the Swiss Oerlikon 35mm machine gun for the Model 61 tank, the Model 74 tank chassis is expected to be adopted for the production model. The Model 61 tank chassis is seen as out of date.

Fabrication of the full AW-X system is expected to start by FY 1983 after decision on adoption of the Model 74 tank chassis. Prior to the full system fabrication, components have been manufactured since FY 1978. Engineering evaluation tests of the fabricated components are scheduled for FY 1981 and 1982.

The Model 74 tank production lines are planned to become unnecessary in FY 1988 when mass production of new main battle tanks replacing Model 74 tanks is scheduled to start. Thus, development of the AW-X would have to be completed in FY 1987 or 1988 in order to secure continuous operation of the Model 74 tank production lines.

CSO: 4120/237

MARITIME SELF-DEFENSE FORCE STUDYING TYPES, REQUIREMENTS FOR PM-X

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 7-8

[Text]

The MSDF is studying candidate types and operational requirements for the PM-X new missile-armed patrol boat in a bid to incorporate a PM-X for operational evaluation into the JDA's FY 1982 budget request in late August. The PM-X is planned to replace the PT torpedo boat.

Candidate types under consideration are a modified commercial jet-foil ship (proposed by Boeing and Hitachi Shipbuilding & Engineering Co.), a SWATH (small waterplane area twin-hull) ship (Mitsui Engineering & Shipbuilding Co.) and a slide type (MHI). Type selection will be based on a comprehensive study covering everything from operations to acquisition, supply and maintenance, and training.

As to operational requirements, the PM-X is designed to undertake the part of the nation's coastal and regional defense missions which cannot be covered by helicopters and destroyers. Compared with the existing PT, it will feature higher speed, and increased mobility and strike power. Weapon systems aboard the projected boat are expected to include Harpoon surface-to-surface missiles and machine gun systems.

The MSDF wants to start mass production of the PM-X under the FY 1983-87 MTDP to be drafted by the end of FY 1981.

CSO: 4120/237

JAPANESE DEFENSE AGENCY CHIEF TO APPROVE 23 R&D ITEMS FOR FY '81

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 pp 8-9

[Text]

Minister for Defense/JDA Director-General Joji Omura will shortly approve 11 engineering-development and 12 engineering-research items as proposed by the TR&DI for FY 1981.

The 23 research and development items were submitted by an advisory council to the JDA chief early in May for consideration.

After approval by the JDA chief, the TR&DI will brief the Finance Ministry on the items and then conclude necessary contracts through the JDA's Central Procurement Office.

The 11 engineering-development items are (1) Type 1 field mine for the Ground Self-Defense Force (GSDF), (2) new minesweeper diesel engine for the Maritime Self-Defense Force (MSDF), (3) high-speed homing torpedo for the MSDF, (4) medium-range field surveillance radar for the GSDF, (5) electronic exchange system for the GSDF, (6) field radio for the GSDF, (7) electronic countermeasure (ECM) system for MSDF surface ships, (8) inertial navigation system for the MSDF, (9) XJ/ALQ-8 ECM system for the Air Self-Defense Force (ASDF), (10) MT-X intermediate trainer for the ASDF, and (11) gas mask and gas wear.

The 12 engineering-research items are (1) new main battle tank for the GSDF, (2) mechanized infantry combat vehicle for the GSDF, (3) antisubmarine short-range torpedo for the MSDF, (4) phase-II sonar research (passive sonar) for the MSDF, (5) future fire-control system for the ASDF, (6) new frontline infrared sensor for the GSDF, (7) portable surface-to-air missile for the GSDF, (8) Chu-MAT medium-range antitank missile for the GSDF, (9) SSM ground-launched antiship missile for the GSDF, (10) control-configured vehicle (CCV) aircraft for the ASDF, (11) small turbofan engine for the ASDF, and (12) remotely-piloted vehicle (RPV) for the ASDF.

CSO: 4120/237

SCIENCE AND TECHNOLOGY

TR&DI TO EVALUATE 25MM, 35MM GUNS FOR MICV

Tokyo JPE AVIATION REPORT-WEEKLY in English No 523, 27 May 81 p 9

[Text]

The TR&DI is expected to evaluate both of 25mm and 35mm guns for a GSDF mechanized-infantry-combat-vehicle (MICV) before launching fabrication of a full MICV system in FY 1983.

The TR&DI is now developing a 35mm gun based on evaluation of the Swiss Oerlikon KDE 35mm machine gun, while the U.S. Army has adopted a 25mm chain gun for its infantry fighting vehicles (IFV). The 25mm gun is seen as more effective to reduce the weight of the vehicle for higher mobility. Attention is paid to whether the TR&DI would adopt a 35mm gun or a 25mm type.

The MICV is planned to obtain service entry certification in FY 1988. The full system development will start in FY 1983 after fabrication of the turret from FY 1980 to 1981 and the chassis from FY 1981 to 1982.

The GSDF intends to deploy the vehicles for the Seventh Division in Hokkaido. It gives priority to mobility among the MICV's performance features, while the gun is designed to be capable of destroying armored plates of enemy vehicles.

CSO: 4120/237

SCIENCE AND TECHNOLOGY

767 FUSELAGE PRODUCTION NOT PROFITABLE

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 pp 3, 4

[Text]

Japanese aircraft manufacturers' production of Boeing 767 fuselages are running a huge deficit because of unexpectedly-high-priced aluminum materials, although the Japan-Italy-Boeing joint 767 program seems to have shifted smoothly to the production stage and the Japanese are delivering one shipset per month without any difficulty.

They intend to start negotiations with Boeing through Civil Transport Development Corp. (CTDC), the Japanese channel for the three-nation program, in increasing of fuselage prices after the roll-out of the first 767 on Aug. 4. A price hike of more than 20 percent would be necessary to offset the deficit, according to their estimate.

Mitsubishi Heavy Industries Ltd. (MHI), Kawasaki Heavy Industries Ltd. (KHI) and Fuji Heavy Industries Ltd. (FHI) have been shocked to find their production of fuselage sections for eight prototype 767s in FY 1980 (April 1980-March 1981) was not paying. The deficit production has so far had no grave effects on their overall business performance because only eight aircraft have been involved. But the deficit will grow serious as 767 production is estimated to increase to 30 aircraft in FY 1981 and 60 aircraft in FY 1982. More than 300 767 orders have already been placed with Boeing.

The deficit problem is also attributed to the Japanese manufacturers' subcontracting position in the program. Although the program seems trilateral, the Japanese participants are serving virtually as subcontractors of Boeing.

In 767 production, new profiling technology has been adopted to manufacture lightweight airframes with priority given to energy conservation. Airframe sections are machined from thick aluminum plates to reduce the number of joints. This technology is very unique and the Japanese firms have been subcontracted to try the difficult technology. Furthermore, they are forced to purchase aluminum plates at unexpectedly high prices.

In the 767 program, MHI manufactures rear fuselage sections, KHI middle and front sections, and FHI middle wing fairings. Although they are running different deficits, they estimate fuselage prices would have to be raised by more than 20 percent to avoid deficits. The Japanese firms hope to put the price hike into effect from the current fiscal year to cover all production-type 767s. However, price-hike negotiations with Boeing are expected to take a long time because the Japanese firms are virtual subcontractors.

CSO: 4105/242

JAPANESE FIRM TO PRODUCE BEARINGS FOR 767S

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 p 4

[Text]

Nippon Miniature Bearing Co. (NMB) has been authorized by the Boeing Co. to produce bearings for Boeing 767s and Boeing's successive commercial aircraft, paving the way for its full participation in the aerospace industry, according to industry sources.

NMB's bearing output for 767s alone is estimated to be worth as much as ¥10,000 million. In the 767 now under development by Boeing, Italy and Japan, 10 kinds of bearings are used for the landing gear's hydraulic actuator. These bearings have high load-supporting capability.

NMB has already supplied the U.S. National Aeronautics and Space Administration (NASA) with spherical bearings for the Space Shuttle Columbia, launched in April, through such U.S. firms as Fairchild, Boeing and Hydraulic Research. NMB's bearings are also expected to be used for the second Space Shuttle to be launched possibly this autumn.

The Japanese bearing manufacturer has been approaching Boeing on this matter since three years ago. The recent authorization enables NMB to deliver 767 bearings directly to Japanese 767 subcontractors, including Mitsubishi Heavy Industries (MHI), Kawasaki Heavy Industries (KHI) and Fuji Heavy Industries (FHI). So far, the delivery has been made through NMB's Boeing-approved subsidiary in the United States. NMB is now also allowed to manufacture Boeing's space-control drawing bearings at its domestic plant.

CSO: 4105/242

SCIENCE AND TECHNOLOGY

FHI'S SHIBUYA ENVISAGES Y-XX FABRICATION FROM 1984

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 pp 5, 6

[Text]

Iwao Shibuya, FHI's Managing Director for aircraft, and Chairman of the Y-XX Special Committee, Society of Japanese Aerospace Companies (SJAC), has recommended that the Japanese aircraft industry's program for development of a new 150-seat transport, dubbed the Y-XX, be launched in 1984.

The industry will not be able to mobilize engineers before 1983 or 1984 because of development of the MT-X intermediate trainer for the Defense Agency starting in the current fiscal year, he said at a press conference in mid-May.

He also said a new engine for a 150-seat transport is unlikely to appear in the immediate future. This reason corresponds to Boeing's view that the engine is a key element for its development of a new 7-7 transport for the 21st century.

As to other reasons for his recommendation, Shibuya said Japan's joint-production of Boeing 767s with the U.S. firm and Italy still remains to show whether or not it is a paying business, and that it would take time to put up sufficient funds for the Y-XX program, including government loans.

Whenever the Y-XX program is launched on a full scale, however, he said, the Japanese industry must hasten selection of foreign partners for the program in order to secure government loans in FY 1982. The FY 1981 budget includes funds for the industry's preparatory design work for the Y-XX. The industry will promote negotiations with candidate partners, including Boeing, Airbus Industrie, McDonnell Douglas Corp. (MDC) and Fokker, he said. The last two firms have teamed up to develop the MDF-100 of the 150-seat class.

As to the MT-X program starting in the current fiscal year, Shibuya expressed FHI's strong hope to become a prime contractor for the program on the basis of its past independent development of the T-1 trainer. FHI acknowledges that the project would play a significant role in upgrading the whole Japanese aircraft industry.

He also said FHI would be able to mobilize about 200 engineers for the program from FY 1983 to 1984 when the project will be at its peak. Even if FHI undertakes license production of the AH-1S antitank helicopter for the Ground Self-Defense Force (GSDF), it could implement the MT-X program smoothly, he added.

CSO: 4105/242

NISSAN'S OKUMA NAMED SJAC VICE CHAIRMAN

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 p 6

[Text]

The Society of Japanese Aerospace Companies (SJAC) at its annual general meeting late in May appointed vice president Masamune Okuma of Nissan Motor Co. as new vice chairman, increasing the number of vice chairmen from two to three.

It also named two experts on space programs as new advisers in a bid to strengthen Japan's space industry. They are Akiyoshi Matsuura, former president of the National Space Development Agency (NASDA), and Sakuyuki Takagi, former secretary general of the Japan International Aerospace Show.

Meanwhile, SJAC Chairman Eiichi Ohara was elected chairman of the board of directors, Civil Transport Development Corp. (CTDC), to succeed Kiyoshi Yotsumoto, who died recently. CTDC is the main Japanese channel for the Boeing 767 program with Boeing and Italy. Ohara is also chairman of Fuji Heavy Industries Ltd.

CSO: 4105/242

SCIENCE AND TECHNOLOGY

JDA TO NAME CONTRACTORS FOR MSDF SHIPS SOON

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 p 7

[Text]

The Japanese Defense Agency (JDA) is expected to name contractors for the Maritime Self-Defense Force's (MSDF) FY 1981 ship procurement in late May or June, and October.

The first selection of contractors in late May or June may involve the gas turbine main powerplant of a 4,500-ton DDG guided-missile destroyer, the hull and main powerplant of a 2,200-ton SSS submarine, and the hull, main powerplant and main generator of a 440-ton MSC coastal minesweeper. KHI, Nippon Kokan and Hitachi Shipbuilding & Engineering Co. will be named to build the SSS and MSC hulls.

The second selection in October is expected to involve the hull of the 4,500-ton DDG, the hull and main powerplant of a 2,900-ton DD destroyer, and the hull and main powerplant of a 3,600-ton AS submarine tender.

Promising candidates for contractors of the DDG and AS hulls are MHI and Mitsui Engineering & Shipbuilding Co., respectively. A DD hull manufacturer will be selected from three destroyer builders excluded from the DDG and AS contracts.

CSO: 4105/242

TR&DI TO BEGIN ENGINEERING RESEARCH ON TAN-SAM-II

Tokyo AVIATION REPORT-WEEKLY in English No 524, 3 Jun 81 pp 8, 9

[Text]

The Technical R&D Institute (TR&DI) of the Defense Agency is expected to kick off in-house engineering research on the Tan-SAM-II, an advanced type of the Model 81 Tan-SAM short-range surface-to-air missile for the GSDF and ASDF, in FY 1981 so that engineering development will be able to begin in FY 1982, according to informed sources.

The Tan-SAM's procurement is to start in the current fiscal year or 12 years after its development was launched in FY 1969 under the FY 1967-71 Third Defense Buildup Program. The missile system is highly valued thanks to its infrared guidance, simultaneous attacks on multiple targets capability and other features.

In consideration of the long time needed for development of the Tan-SAM using high technology, the TR&DI and GSDF have intended to start a Tan-SAM-II program as early as possible. This program is believed subject to coordination between the TR&DI, GSDF and other sectors concerned at present.

This new SAM system is expected to have more advanced all-weather capability and stronger ECCM (electronic counter countermeasure) capability than the Tan-SAM. It may also be capable of hitting not only multiple targets but also various kinds of targets simultaneously.

The GSDF's current antiaircraft weapons systems consist of the basic Hawk system, the improved Hawk system and the L-90 35mm gun. In addition, the Tan-SAM and portable SAM will be procured in the immediate future. Furthermore, the existing four basic Hawk systems are planned to be replaced by still-indefinite SAM-X systems.

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